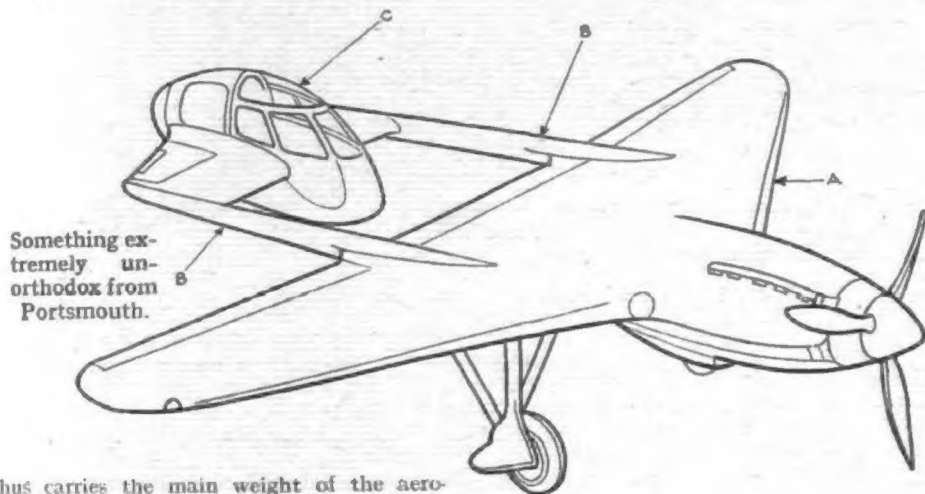


Unorthodox Design

A VERY unusual design of aircraft emanates from a well-known factory and is described in this specification, which claims particular advantages for military purposes. There is no fuselage in the usually accepted sense of the term, the tail structure being connected to the wing by relatively slender booms so as to leave a large open space in the central portion usually occupied by the fuselage. The crew are accommodated in a cabin in the tail structure.

This construction leads to a considerable reduction in surface, particularly in the immediate region of the airscrew.

A monoplane constructed in this manner is shown in the illustration. The single wing A carries the engine fuel tanks, landing gear, etc., and B, B are two slender tail booms of tubular construction to which the rear portion C containing the pilots' cockpit is attached. The front portion A



Something extremely unorthodox from Portsmouth.

thus carries the main weight of the aeroplane, including the armament, while in the rear portion, in addition to the crew, there are the elevators and rudder.

The large open space allows the pilot a wide range of vision, since he can see downward between the two portions of the aeroplane and their interconnecting booms and forward above the wings. Provision can also be made for the cockpit seat to be raised or lowered so as to increase the vision range above or below the main plane as required.

For this construction many advantages are claimed, the chief of which is the reduction of friction area. Again, when the pilot is situated in the tail he can carefully watch the wheels as they approach the ground.—*Patent No. 470650: Airspeed (1934). Ltd., and A. H. Tiltman.*

Flaps and Split Flaps

AS is generally known, flaps are used on the trailing edge of a wing to increase the lift; this is desirable under certain flying conditions, the most important being as follows:—

(a) When taking off, in order to reduce the length of the run. Here increase in lift without increase in drag is required.

(b) On landing, to reduce the landing speed, increase of lift and drag being desirable.

(c) In certain instances during diving, to reduce diving speeds, increase in drag being here more important than increase in lift.

The design of flaps necessary for the first set of conditions differs from that most suitable for the second and third conditions.

In order to arrive at conditions more suitable to all the above conditions auxiliary flaps or split flaps have been used, and a method of control is described in this patent which enables the split flap to be operated

The TREND of INVENTION

Recent Aeronautical Patents Reviewed

when the main flap is in either the faired or the projected position.

Thus four combinations of position are possible:—

(1) Flap faired, split flap faired; for ordinary flying conditions.

(2) Flap projected rearward and downward, split flap faired; for increased lift during take off.

(3) Flap projected rearward and downward, split flap lowered; for increasing lift and drag to reduce landing speed.

(4) Flap faired, split flap lowered; to act as an air brake.

In the illustration the third of the above conditions is shown, i.e., the condition for increasing lift and drag in order to reduce landing speed.

The flap, which is shown at A, is carried by the main wing in curved guides C by cross pieces D and E, and movement is effected by the hydraulic jack F.

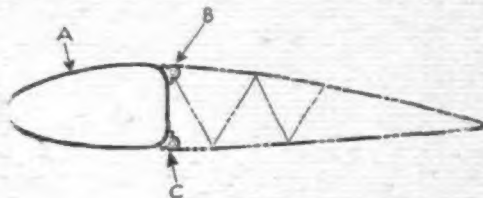
The split flap B is pivoted near its leading edge to the flap A and is connected by a link and lever mechanism and a bevel gear with a splined telescopic shaft, one part of which is mounted on the flap A and the other part of the main wing. In this way a torsional movement may be transmitted from the cockpit through the telescopic shaft to operate the split flaps, independent of the position of the main flaps. Balancing arrangements between the split flaps on either side of the aircraft are described.—*Patent No. 473379: Fairey Aviation Co., Ltd., and A. C. Brown.*

Wing Tanks

A METHOD of construction is described whereby fuel tanks in wings are so designed that by attachment to the spar booms they take the place of the web of

the spar; thus the tank serves the dual purpose of fuel container and also load- and torsion-resisting member of the wing structure.

This leads to a considerable saving in weight, particularly with aircraft requiring a very long range, and at the same time very large quantities of fuel can be carried in a wing of given dimensions. Further, the tanks are readily accessible for inspection and repairs.



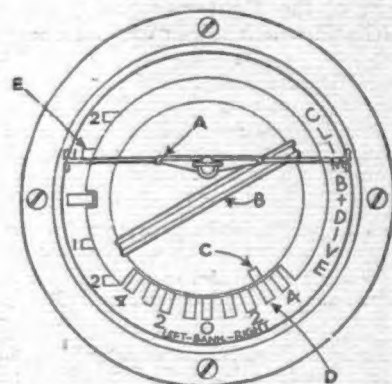
Tank-cum-wing by Vickers-Supermarine.

It will be seen from the illustration that the tank A is made to conform to the profile of the leading edge and is situated in front of the spar, the booms of which are shown at B and C. The rear of the tank is arranged vertically between these booms and is attached to them by lugs; this side thus forms the web of the single spar. Alternatively, separate webs may be used, in which case the tanks are made separate and are easily detachable. The portion of the wing extending aft of the spar is made in the usual manner.

Instead of the tank forming the leading edge it may occupy an intermediate position, in which case the leading face of the tank supports the boom and, if there is a two-spar construction, the tank will extend between them.—*Patent No. 472839: Supermarine Aviation Works (Vickers), Ltd., and R. J. Mitchell.*

Blind-flying Instruments

IT is very desirable that instruments used for blind flying, such as the gyroscopic artificial horizon, should be capable of being easily read by the pilot, and that no mental effort should be required to interpret the indications given, in order to appreciate the

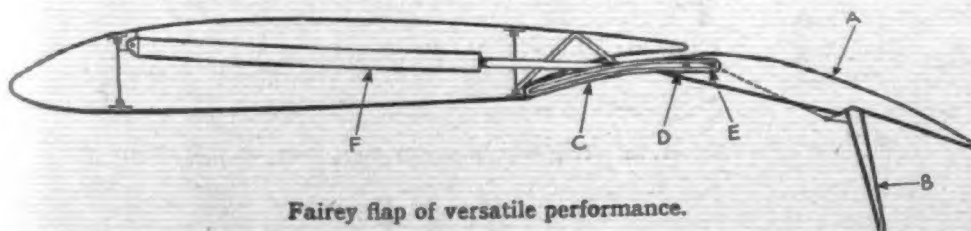


Clear artificial-horizon indication (Sperry).

actual movements of the aeroplane that are taking place. In many cases reversing mechanisms have to be employed, in order that an actual climbing movement may not appear as a downward pitching movement.

In this Sperry patent an instrument is described in which both roll and pitch are indicated in a visual manner, no mental reversal being necessary on the part of the pilot, and no reversing means being employed in the instrument itself.

In one form, the face of the instrument appears as in the accompanying illustration. A miniature aeroplane is shown at A, while the reference wires B represent a horizon. The illustration shows that the aircraft is climbing, since the aeroplane A is above the wires B, and it is also banked to the right, since the right wing has dipped down. The amount of bank is indicated by the index C on scale D and the amount of climb by the position of the tip of the wing on the scale E.—*Patent No. 473688: Sperry Gyroscope Co. Inc.*



Fairey flap of versatile performance.